REMARKS

Claims 1-22 remain in this application. They have been amended for purposes of clarification.

Claims 1, 2, 6, 8, 11, 13, 14, 18, 19 and 22 are rejected under 35 U.S.C. §102(b) as allegedly being anticipated by *Bell et al.*'937. Claims 3-5, 7, 9-10, 12, 15-17, and 20-21 have been rejected under 35 U.S.C. §103 as allegedly being unpatentable over *Bell et al.* '937 in combination with one or more of *Akimoto et al.*, *Francini et al.* '011, and *Bell et al.* '989. As stated in sections 2.a., 2.c. and 2.f. of the Office Action, and in several other places throughout the Office Action, Fig. 9 and column 8, lines 6-61 of *Bell et al.* '937 are relied upon for allegedly disclosing a three-dimensional construction unit for constructing three-dimensional data by using data from input images for the characteristic areas of the object and by using data from the converted images for remaining areas of the object. The Office Action also relies on this portion of *Bell et al.* '937 for allegedly disclosing that the three-dimensional data set comprises a first part and a second part, the first part being generated using the first original data set and second original data set, and the second part being generated using the first low resolution data set and the second low resolution data set.

Independent claim 1 is directed to an apparatus for generating a three-dimensional data set, comprising novel combinations of features including a three-dimensional generating portion for generating a three-dimensional data set of an object. The data set of the object includes a first part and a second part, wherein the first part is generated using higher resolution data and the second part is generated using lower resolution data. Claims

6 and 11 are directed to three-dimensional data generating device combinations including a construction unit for reconstructing three-dimensional data of an object. The claim 6 construction unit uses data from input images for characteristic areas of an object and data from converted images for remaining areas of the object. The claim 11 construction unit uses high resolution images for selected areas and low resolution images for nonselected areas.

Claim 12 is directed to a three-dimensional data generating device combination that includes, among other elements, a replacing device for replacing low resolution three dimensional data for specific areas with high resolution three dimensional data.

Similarly, independent method claim 13 is directed to a method for generating a three-dimensional data set, wherein the three-dimensional data set comprises a first part and a second part, with the first part being generated using data of a first resolution and the second part being generated using data of a second resolution that is lower than the first resolution.

Claim 18 defines a method of generating three dimensional data of an object that includes, among other elements, constructing the three dimensional data set by using data from input images for characteristic areas of the object and by using data from converted images for remaining areas of the object.

As described in paragraph [0011] of the specification, the above-described features provide a three-dimensional data generating device that can maintain the high resolution of areas having complex shape characteristics and still reduce the processing time. As further explained in paragraphs [0062] - [0065] of the specification with regard to the preferred

embodiments, low-resolution points are obtained for low-precision areas, and high-resolution points are obtained for high-precision areas, with a three-dimensional reconstruction unit reconstructing the three-dimensional positions from a combination of the low-resolution points and the high-resolution points. Consequently, as described at paragraph [0087], three-dimensional position data, which comprises high-resolution, high-precision data for the high-precision areas, and low-resolution, low-precision data for the other areas is obtained.

In contrast to the above-described inventions, as set forth in independent claims 1, 6, 11, 12, 13 and 18, *Bell et al.* '937 is concerned with mutually registering multiple images that have been derived from diverse types of image collection devices. The images are initially subsampled to obtain reduced spatial resolution versions of each image. Neighborhoods of pixels of each image are cross-correlated with one another, to derive a measure of misregistration between the images. The neighborhood cross-correlation process is then repeated for increasingly higher spatial resolution versions of each image, to effect a coarse-to-fine improvement in registration error correction. As discussed in column 4, lines 1-13 of *Bell et al.* '937, the neighborhood correlation process is repeated for increasingly higher spatial resolution versions of each of the two images so as to iteratively modify the geometric models of the sensors and thereby further improve mutual registration of the two images. Each time the neighborhood correlation process is repeated for a particular spatial resolution version of each of the two images, the result is a new three-dimensional cross-correlation surface, such as shown in Fig. 9, having respective

peaks where there is a high degree of correlation of the contents of the respective image neighborhoods.

Referring to column 7, line 36 - column 8, line 61 of *Bell et al.* '937, the described correlation process starts with a relatively low spatial resolution image version for both a base image 21B and a second base image 22B. The number of pixels per neighborhood 52 in the second image 22 is larger than the number of pixels per neighborhood 51 in the first image 21, with a relatively low spatial resolution image provided for both image 21 and image 22. Once the respective neighborhoods 51 and 52 have been defined for each of the images 21 and 22, the neighborhoods of pixels 51 and 52 are translated onto a registration surface 31 and are correlated with one another to derive a measure of the degree of co-registration between the first and second images. The cross-correlation of the neighborhoods of pixels produces a three-dimensional cross-correlation surface 71, diagrammatically illustrated in Fig. 9. The three-dimensional cross-correlation surface 71 is produced from image data of the same spatial resolution.

As described in column 4, lines 1-13, it is only when further improvement in the mutual registration of the two images is desired that the neighborhood correlation process is repeated for increasingly higher spatial resolution versions of each of the two images.

However, the three-dimensional data in Fig. 9 of Bell et al. '937 merely represents a degree of correlation between respective neighborhoods. See column 11, lines 11-36 and column 13, lines 2-9. Accordingly, the data does not represent a shape of the object.

Accordingly, Applicant submits that *Bell et al.* '937 does not teach or suggest a three-dimensional data set of the object comprising a first part and a second part, where the

first part is generated or constructed using data of a first resolution and the second part is generated or constructed using data of a second resolution that is different than the first resolution. All claims are therefore novel and nonobvious over *Bell et al.* '937.

Furthermore, the additional applied references, *Akimoto et al.*, *Francini et al.* and *Bell et al.* '989, are not relied upon in the Office Action for a disclosure of the above-described features, and do not overcome the deficiencies of *Bell et al.* '937. *Akimoto et al.* is directed to automatic creation of a 3D facial model by modifying a generic head model. *Akimoto et al.* does not disclose or suggest generating a three-dimensional data set having a first part generated using data of a first resolution and a second part generated using data of a second resolution different than said first resolution. *Francini et al.* is also concerned with modifying a model, using identified and extracted feature points from an image. *Bell et al.* '989, like *Bell et al.* '937, is concerned with mutually registering multiple images that have been derived from diverse types of image collection devices. Neither *Francini et al.* nor *Bell et al.* '989 teach or suggest a three-dimensional data set comprising a first part and a second part, where the first part is generated using data of a first resolution and the second part is generated using data of a second resolution that is different than the first resolution.

Accordingly, for at least the reasons discussed above, Applicant respectfully submits that all claims 1-22 are novel and non-obvious in view of *Bell et al.* '937, *Akimoto et al.*, *Francini et al.* and *Bell et al.* '989, whether considered alone or in combination. Applicant requests withdrawal of all rejections under 35 U.S.C. §§ 102 and 103, and allowance of this application.

Respectfully submitted,

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